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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/762,000	01/21/2004	Scott J. Broussard	AUS920030872US1	4404
65362 7590 01/21/2009 HAMILTON & TERRILE, LLP IBM Austin P.O. BOX 203518 AUSTIN, TX 78720				
EXAMINER				
TO, JENNIFER N				
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2195				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/762,000

**Applicant(s)**

BROUSSARD ET AL.

**Examiner**

JENNIFER N. TO

**Art Unit**

2195

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 October 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1.5-9,13-17 and 21-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1.5-9,13-17 and 21-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/S508)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

1. Claims 1, 5-9, 13-17, and 21-24 are pending for examination.

***Claim Rejections - 35 USC § 101***

2. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claims 9 and 13-16 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Page 51 line 23 through page 52 line 4 of Appellant's specification provide guidance as to what falls within the scope of the phrase "computer-readable medium" as recited in rejected claims 9, and 13-16. The pertinent portion of page 51 line 23 through page 52 line 4 (as amended by applicant in the amendment filed 03/11/2008) are as follows:

It is important to note that while the present invention has been described in the context of a fully functioning data processing system, those of ordinary skill in the art will appreciate that the processes of the present invention are capable of being distributed in the form of instructions in a computer readable medium and a variety of other forms. Examples of computer readable media include media such as EPROM, ROM, tape, **paper**, floppy disc, hard disk drive, RAM, and CD-ROMs.

Thus it is clear that while applicant had not provided an explicit and deliberate definition limiting the phrase "computer-readable medium", applicant has provided an explicit and deliberate definition of items applicant intends to fall within the scope of

"computer-readable medium". Within this list of items are type of media which would have been recognized by one of ordinary skill at the time the invention as storage media and printed matter. It is believed that the types of storage media listed by applicant would have been enable the recited program logic, when stored thereon, to be read and executed by a computer and realize its functionality. It is not believed, however, that the recited propagation or transmission media would likewise enable the functionality to be realized. Absent recitation of some means for receiving and processing the program, propagation or transmission media are not believed to be, in and of themselves, capable of providing the program in a manner which enables it to be read and executed by a computer, with subsequent realization of its functionality to accomplish a practical application by causing the computer to perform operations with a useful, concrete and tangible result.

Certainly, Applicant's inclusion of a piece of ***paper*** with the program printed thereon within the scope of "computer-readable medium" indicates the claims are sufficiently broad to read on non-functional descriptive material, printed matter. Printed matter which fails to be functionally interrelated to its substrate has long been held to be nonstatutory.

From M.P.E.P. 706.03(a):

For example, a mere arrangement of printed matter, though seemingly a "manufacture," is rejected as not being within the statutory classes. See *In re Miller*, 418 F.2d 1392, 164 USPQ 46 (CCPA 1969); *Ex parte Gwinn*, 112 USPQ 439 (Bd. App. 1955); and *In re Jones*, 373 F.2d 1007, 153 USPQ 77 (CCPA 1967).

As such, claims 9, and 13-16 are not limited to embodiments which would enable the program to act as a computer component and realize its functionality to provide a practical application with a useful, concrete and tangible result. Note that any deletions from the specification may raise a question with respect to New Matter.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 5-9, 13-17, and 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over van Rietschote et al. (hereafter Rietschote) (U.S. Patent No. 7203944), as applied in claims 1, 3 above, and in view of Zhu et al. (hereafter Zhu) (Jessica2: A Distributed Java Virtual Machine with transparent Thread Migration Support", IEEE, 2002, pages 381-388).

6. Rietschote and Zhu were cited in IDS filed 05/30/2008.

7. As per claim 1, Rietschote teaches the invention substantially as claim including a method for operating a virtual machine within a data processing system (abstract), the method comprising the computer-implemented steps of:

running a plurality of virtual machines on one or more devices within the data processing system, wherein each virtual machine in the plurality of virtual machines incorporates functionality for interoperating with other virtual machine in a virtual machine cluster (abstract; col. 2, lines 11-15; col. 3, lines 1-5);

associating the plurality of virtual machines in a virtual machine cluster, wherein each virtual machine in the virtual machine cluster acts as a node within the virtual machine cluster (abstract; col. 2, lines 15-16; col. 3, line 6 through col. 4, line 47);

sharing information about the plurality of virtual machines within the virtual machine cluster such that a virtual machine may be added to the virtual machine cluster or such that a virtual machine may be removed from the virtual machine cluster as the plurality of virtual machines continues to run (abstract; col. 2, lines 16-24; col. 4, line 59 through col. 5, line 21; col. 6, lines 64-66; col. 7, lines 64-66), sharing information further comprising sharing load values representing computer resource utilization among the virtual machines in the virtual machine cluster (col. 4, line 66 through col. 6, line 55);

performing a load balancing operating across the virtual machine cluster (col. 4, line 66 through col. 6, line 55); and

determining that a CPU load utilization on a first virtual machine exceeds a threshold value (col. 4, line 66 through col. 6, line 55).

8. Rietschote did not specifically teach moving a thread from the first virtual machine to a second virtual machine during a load balancing operating.

9. However, Zhu teaches moving a thread from the first virtual machine to a second virtual machine during a load balancing operating (fig. 1; section 2, i.e. the java threads in the application can migrate from one node to another upon receiving requests from the load monitor).

10. It would have been obvious to one of an ordinary skill in the art at the time the invention was made to have combined the teaching of Rietschote and Zhu because Rietschote teaches a system for migrating virtual machines among computer systems to balance the load, and Zhu also teaching a system for support the migration of Java Virtual Machine. In addition Zhu teaching of moving a thread from the first virtual machine to a second virtual machine during a load balancing operating would improve the integrity of Rietschote by providing a true parallel execution environment for multithreaded Java application in a distributed Java Virtual Machine (Zhu, abstract).

11. As per claim 5, Rietschote teaches determining that a memory load utilization on the first virtual machine exceeds a threshold value (col. 10, lines 13-57). Rietschote did not specifically teach moving a set of one or more objects from the first virtual machine to a second virtual machine during a load-balancing operation.

12. However, Zhu teaches moving a set of one or more objects from the first virtual machine to a second virtual machine during a load-balancing operation (section 3, migrate all the objects used by the migrated thread to another node; section 4.1).

13. It would have been obvious to one of an ordinary skill in the art at the time the invention was made to have combined the teaching of Rietschote and Zhu because Rietschote teaches a system for migrating virtual machines among computer systems to balance the load, and Zhu also teaching a system for support the migration of Java Virtual Machine. In addition Zhu teaching of moving a set of one or more objects from the first virtual machine to a second virtual machine during a load-balancing operation would improve the integrity of Rietschote by providing a true parallel execution environment for multithreaded Java application in a distributed Java Virtual Machine (Zhu, abstract).

14. As per claims 6-7, they are rejected for the same reason as claim 1 above.

15. As per claim 8, Rietschote teaches the invention substantially as claimed in claim 1. Rietschote did not specifically teach running a multithread application within the virtual machine cluster, and dispatching threads of the multithreaded application on different virtual machines such that execution of the multithreaded application spans multiple virtual machines.

16. However, Zhu teaches running a multithread application within the virtual machine cluster, and dispatching threads of the multithreaded application on different virtual machines such that execution of the multithreaded application spans multiple virtual machines (abstract; figs 1-2; sections 2-3).



17. It would have been obvious to one of an ordinary skill in the art at the time the invention was made to have combined the teaching of Rietschote and Zhu because Rietschote teaches a system for migrating virtual machines among computer systems to balance the load, and Zhu also teaching a system for support the migration of Java Virtual Machine. In addition Zhu teaching of running a multithread application within the virtual machine cluster, and dispatching threads of the multithreaded application on different virtual machines such that execution of the multithreaded application spans multiple virtual machines would improve the integrity of Rietschote by providing a true parallel execution environment for multithreaded Java application in a distributed Java Virtual Machine (Zhu, abstract).

18. As per claims 9, 13-17, and 21-24, they are rejected for the same reason as claims 1, 5-8 above.

#### ***Response to Arguments***

19. Applicant's arguments filed 10/29/2008 have been fully considered but they are not persuasive.

20. In the remark, applicant argued that (1) Rietschote fails to teach sharing information about a plurality of virtual machines within the virtual machine cluster such that a virtual machine may be added to the virtual machine cluster or such that a virtual

machine may be removed from the virtual machine cluster as the plurality of virtual machines continues to run (2) Rietschote and Zhu fail to teach determining that a CPU load utilization on the first virtual machine exceeds a threshold value and moving a thread from the first virtual machine to a second virtual machine during a load balancing operation in response to the first virtual machine exceeding the threshold value.

21. Examiner respectful disagreed with applicant argument.

As to point (1), Rietschote disclosed the system have more than one cluster of virtual machines, each group is being managed by the virtual machine kernel (col. 3, lines 1-5, cluster of virtual machine 16A and 16B, cluster of virtual machine 16C and 16 D, the last cluster only one virtual machine 16E) the load on a computer system (for example, computer system 10B of fig. 1) is calculated by the virtual machine kernel 18B associated the virtual machines 16C and 16D based on the sum of the loads of the virtual machines. It would have been obvious to one of the ordinary skill in the art at the time the invention was made to have recognized that in order for the virtual machine kernel 18B to calculated the system load of the virtual machines 16C and 16D, the virtual machines 16C and 16D must reported/shared its load with the virtual machine kernel 18B. Thus, by reporting/sharing the load with the virtual machine kernel 18B, the virtual machines 16C and 16D are indirectly sharing their load information through the virtual machine kernel 18B. In addition, the claimed language did not clear as to the sharing information between the virtual machine within the virtual machine cluster is directly or indirectly (for example through virtual machine kernel as disclosed by

Rietschote). Thus, Rietschote teaches sharing information about a plurality of virtual machines within the virtual machine cluster. In addition, Rietschote also teaches that the sharing information between virtual machines within the virtual machine cluster result in a virtual machine may be added to the virtual machine cluster or such that a virtual machine may be removed from the virtual machine cluster as the plurality of virtual machines continues to run (abstract; col. 2, lines 16-24; col. 4, line 59 through col. 5, line 21; col. 6, lines 64-66; col. 7, lines 64-66). Therefore, Rietschote teaches sharing information about a plurality of virtual machines within the virtual machine cluster such that a virtual machine may be added to the virtual machine cluster or such that a virtual machine may be removed from the virtual machine cluster as the plurality of virtual machines continues to run

As to point (2), Rietschote teaches determining that a CPU load utilization on the first virtual machine exceeds a threshold value (fig. 1; col. 4, line 66 through col. 5, lines 20, 38-42, based on fig. 1, the computer system 10N only have the virtual machine 16E, the load of the computer system 10N in this case is the load of virtual machine, if the computer system load exceed the desired load (exceeds a threshold value), then the migrating process is activated). Zhu teaches that based on the load condition (overload/under load) the java threads in the virtual machine can migrate from one node to another (fig. 1; section 2). It would have been obvious to one of an ordinary skill in the art at the time the invention was made to have combined the teaching of Rietschote and Zhu because Rietschote teaches a system for migrating virtual machines among computer systems to balance the load, and Zhu also teaching a system for support the

migration of Java Virtual Machine. In addition Zhu teaching of moving a thread from the first virtual machine to a second virtual machine during a load balancing operating would improve the integrity of Rietschote by providing a true parallel execution environment for multithreaded Java application in a distributed Java Virtual Machine (Zhu, abstract). Therefore, the combination of Rietschote and Zhu teaches determining that a CPU load utilization on the first virtual machine exceeds a threshold value and moving a thread from the first virtual machine to a second virtual machine during a load balancing operation in response to the first virtual machine exceeding the threshold value.

### ***Conclusion***

22. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JENNIFER N. TO whose telephone number is (571)272-7212. The examiner can normally be reached on M-T 6AM- 3:30 PM, F 6AM- 2:30 PM.

24. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

25. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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